

REMARKS/ARGUMENTS

All of the claims considered by the Examiner (i.e., claims 18-28 and 31-34) were rejected on the basis of US patent No. 6,625,160 to Suzuki standing alone or in combination with a secondary reference. In particular, the outstanding office action relies primarily on Figure 5 of the Suzuki reference. The pending rejections are respectfully traversed.

Figure 5 of the Suzuki reference diagrammatically shows the logical operation of a traditional crossbar switch 136. That is, the diagram shows the internal structure of a single crossbar switch 136. Preliminarily, it is noted that the outstanding rejections appear to improperly interpret some of the individual components of the crossbar switch 136 as being the entire crossbar switch. It is suspected that this simple misunderstanding of the teachings of the Suzuki reference may have lead to the misapplication of the art. For the reasons set forth below, it is respectfully submitted that the rejections that are based on that improper interpretation of the reference do not make a *prima facie* case of unpatentability and that accordingly the outstanding rejections should be withdrawn.

The Rejection of Claim 31

Claim 31 generally requires a receiver having two different buffers that are associated with an input line. The buffers are effectively used to presort the received packets based on a predetermined criteria. Each buffer is coupled to an associated crossbar. The outstanding rejection of claim 31 identifies lookup table mapper 506 of Suzuki as the feature that sorts the data packets and the queues 516/518 as corresponding to the claimed buffer structure. To understand the inherent flaws of the outstanding rejection, it must be appreciated that the mappers 506 and queues 516/518 are subcomponents of a conventional crossbar switch. Therefore, since the outstanding rejection relies on the crossbar 136 to meet the language of the receiver, Figure 5 does not have any remaining structure whatsoever that can reasonably be construed to correspond to either of the two crossbars recited in Claim 31.

The Office Action appears to acknowledge this fact when it points out that "Suzuki does not show a first or second crossbar that connects data from the first and second buffer to any of the plurality of output lines."¹ However, the rejection relies on Figures 1 and 3 of McGill to show a routing switch that utilizes a pair of crossbars that connect data from different buffers to a plurality of output lines. The rejection then proceeds to assert that: "It would have been obvious ... to modify the switching node of Suzuki by enabling the first and second crossbars to connect

¹ See, the second to the last paragraph of page 7 of the Office Action dated April 15, 2004.

data from the first and second buffers to any of the plurality of output lines.”² It is respectfully submitted that such a combination would make no sense whatsoever. Specifically, the rejection appears to suggest a structure wherein an input line is coupled to a structure (lookup tables 506 and queues 516/518) that sorts the packets into queues that are each uniquely associated with a single output line. The combination would then require that a crossbar switch be coupled to each queue allegedly to “provide redundancy to enable that data from either buffer may be connected to its appropriate output line if one of the two crossbars fails.”³ However since each output queue 516/518 only has packets that are destined for a single output, there is absolutely no reason whatsoever to insert a crossbar switch which by definition is intended to couple any of multiple inputs with any of multiple outputs. Furthermore, the hypothetical structure proposed in the outstanding office action would not provide redundancy since a failure of either of the crossbars would presumably prevent any of the contents of its associated queue from being delivered.

In view of the foregoing, it is respectfully submitted that the outstanding rejection does not establish a *prima facie* case of unpatentability and that the outstanding rejections of claims 31 should be withdrawn for at least this reason.

The Rejection of Claims 32-34

Claims 32-34 each depend either directly or indirectly from independent claim 31 and have been rejected on the same combination of references as claim 31. Accordingly, it is respectfully submitted that the outstanding rejections of these claims should be withdrawn for at least the reasons set forth above with respect to claim 31. Additionally, dependent claims 32-34 require additional elements that when considered in the context of the claimed invention, further patentably distinguish the art of record.

The Rejection of Claims 18-28

As pointed out in the last response, Claim 18 is directed at a node having first and second buffers which each have an associated crossbar. Incoming packets (e.g. data segments) are presorted into the appropriate buffers before entering the crossbar switch. Each buffer uses a distinct crossbar switch, which as described in the specification, has the advantage of improved efficiency. Claim 23 is a method claim directed at a method of routing a received data packet through a node using a similar approach. The outstanding rejection takes the position that such a structure is illustrated in Figure 5 of Suzuki. This assertion is respectfully traversed.

² See the second paragraph of page 8 of the Office Action dated April 15, 2004.

³ See the second paragraph of page 8 of the Office Action dated April 15, 2004.

Figure 5 of Suzuki shows a conventional crossbar switch arrangement 136, which has a number of lookup table mappers 506-510 that feed internal queues 516-526. It is important to understand that each input line (e.g. 163) is arranged to feed a single associated lookup table mapper (e.g., 506). The lookup table mappers (e.g., 506) are each arranged to map each received data packet to its appropriate output line. The lookup table mappers each have a dedicated queue (e.g. 516, 518) for each and every output line (e.g. 174, 176). See, col. 9, lines 5-8. Therefore, the queues 516-526 in Suzuki do not pass packets to associated crossbars as required by claim 18 and 23. Accordingly, it is respectfully submitted that pending claims 18, 20-23, 25 and 27-28 are in no way anticipated by Fig. 5 of Suzuki and that the pending rejection of these claims should be withdrawn for at least this reason.

It is noted that the outstanding office action appears to have maintained the position that schedulers 528/530 somehow constitute the claimed crossbars. The characterization is respectfully traversed. The schedulers 528/530 are just that, schedulers. That is, they simply schedule packets for a single associated output line that have already been sorted and are waiting in the queues 516-526. As would be appreciated by those skilled in the art, a crossbar is conceptually a unit that acts as an M by N switch where any input (M) can be routed to any output (N). [Although as pointed out in the specification, the crossbar may be designed so that an input cannot feed itself]. The schedulers 528/530 do not perform such a switching functionality. Rather, each scheduler (e.g. scheduler 528) simply receives inputs from a number of sources (e.g., queues 516, 520 and 524) and schedules those inputs for a single output line (e.g. 174).

As pointed out above, it should be appreciated that Fig. 5 of Suzuki diagrammatically shows the logical operation of a traditional crossbar switch 136. That is, the diagram shows the internal structure of a single crossbar switch 136. In pointing to the schedulers 528, the outstanding rejections appear to interpret one component of the crossbar 136 as constituting an entire crossbar. It is respectfully submitted that those skilled in the art would readily understand that the schedulers 528 and 530 do not in any way independently act as crossbars. As explained above, a crossbar is conceptually a unit that acts as an M by N switch. Inherently both M and N must be greater than one. In contrast the schedules 528,530 effectively take inputs from a plurality of inputs and output those on a single associated output line. Thus, the schedulers act in some ways more like a multiplexer. That is, they operate M to 1 as opposed to M by N, which is a basic requirement of a crossbar.

In view of the foregoing, it is respectfully submitted that nothing in Figure 5 of the Suzuki reference discloses or reasonably suggests an arrangement wherein a node has first and second buffers which receive packets (or data segments) based on information contained in a

packet (or data segment) and wherein each buffer has an associated crossbar. Accordingly, it is respectfully submitted that the outstanding rejections of claims 18, 20-23, 25, 27 and 28 as being anticipated by Suzuki should be withdrawn for at least this reason.

Dependent claims 19, 24 and 26 were rejected on the basis of Suzuki in combination with Kessler. However, Kessler does not overcome the deficiencies of the Suzuki reference with the respect to the independent claims and therefore it is respectfully submitted that these dependent claims are patentable for at least the reason set forth above.

Additionally, all of the various dependent claims 19-22 and 24-28 each depend either directly or indirectly from one of independent claims 18 or 23. These dependent claims require other elements that when considered in the context of the claimed inventions, further patentably distinguish the art of record.

In view of the forgoing, it is respectfully submitted that the pending rejections should be withdrawn. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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